REMARKS

Favorable reconsideration and allowance of the present application in view of the foregoing amendments and following remarks are respectfully requested.

Currently, claims 1, 3, 9, 10, 12-15, 27-30, 34-36, 53-78 and 82-139 remain pending in the present application, including independent claims 1, 27, 82, 92, 103, 115 and 127. In the latest Office Action, claims 1-12, 14, 15, 27-35, 53-78 and 92-102 were indicated as being allowed.

Claims 82-91 and 103-139, on the other hand, stand rejected under 35 U.S.C. § 103 over Dobson in view of Griner and Tanaka. Reconsideration is respectfully requested.

Independent claim 82, for instance, is directed to placing a semiconductor substrate in a processing chamber and directing a laser beam onto the substrate such that the laser beam is configured to strike the substrate at an angle of incidence of at least 10° and to strike the substrate in or near a p-polarization plane. Claim 82 requires that the laser beam be emitted by a laser diode. As now amended, claim 82 requires that the laser diode directly emit a laser beam onto the substrate.

In the Office Action, Tanaka was cited as disclosing a laser diode. Tanaka, however, in column 5, discloses the use of a YAG laser. In Tanaka, the YAG laser includes a laser diode for exciting a cylindrical crystal. As opposed to the presently pending claims, however, the laser diode does not directly emit a laser beam onto a semiconductor substrate.

YAG lasers are solid state lasers that include a solid medium that can be pumped to a higher energy state. The YAG laser further includes a means of pumping energy into the lasing medium and a resonator. In Tanaka, the means of pumping energy into the lasing medium include a flash lamp and laser diode. Thus, the laser

diode is used to pump energy into the solid medium in order to place atoms/ions/or molecules into an upper energy level and does not itself directly emit a laser beam onto the substrate. As such, Applicant submits that Tanaka does not disclose or suggest the use of a laser diode as required in independent claim 82. Thus, Applicant submits that claim 82 is patentable over the combination of references.

The Examiner's attention is also directed to independent claims 103 and 127. Claim 103 is directed to a process for heating semiconductor substrates in which a semiconductor substrate is placed in a processing chamber that has an irregular surface that comprise non-smooth features. As now amended, claim 103 requires the active step of determining an optimal angle of incidence of a light beam that optimizes the amount the light beam is absorbed by the substrate and that optimizes the uniformity of the absorption of the light by the substrate. Once the optimal angle of incidence is determined, a laser beam is then emitted onto the substrate at the determined angle. The laser beam strikes the substrate at an angle of incidence of at least 10° and in a p-polarization plane or near a p-polarization plane.

Independent claim 127 is also directed to a process for heating semiconductor substrates. In claim 127, the semiconductor substrate is coated with materials that form a pattern on a surface of the substrate. Similar to claim 103, claim 127 now requires that, based upon the pattern of coated materials on the surface of the substrate, an optimal angle of incidence is determined of a light beam that optimizes the amount of light energy absorbed by the substrate and that also optimizes the uniformity of absorption.

As stated in the specification on page 16, in one embodiment, for instance, when dealing with a substrate having a 3-dimensional surface, a planar surface can be defined that basically takes into account the surface irregularities. Once the planar

surface is defined, the polarization, the angle of incidence, and the wavelength of light to contact the surface can be selected so as to optimize absorption and uniformity. Such a process that requires that an optimal angle be determined based upon surface irregularities or a pattern of coatings is not disclosed or suggested in any of the three references cited in the Office Action. As such, it is believed that claims 103 and 127 as now amended patentably define over the cited prior art.

The Examiner's attention is also directed to independent claim 115 that is particularly directed to a process for heating semiconductor substrates during an ion implantation annealing process. Ion implantation is a materials engineering process by which ions of a material can be implanted into another solid, thereby changing the physical properties of the solid. The ions introduce both a chemical change in the target, in that they can be a different element than the target and a structural change, in that the crystal structure of the target may be modified. During ion implantation, ions are introduced below the surface of the layer.

In the Office Action, Dobson was cited as disclosing an ion implantation process. To the contrary, in column 5, Dobson discloses a process that causes smoothing of an epitaxial layer by cation surface diffusion that leads to increased widths of the growth terraces. Thus, in Dobson, a surface diffusion process is disclosed instead of an ion implantation process as required in independent claim 115. In view of these differences, Applicant submits that claim 115 patentably defines over Dobson either alone or in combination with the other cited references.

In summary, it is believed that the present application as currently amended is in complete condition for allowance. Favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this response, however, then Examiner Fuqua is invited and encouraged to telephone the undersigned at her convenience.

Please charge any additional fees required by this Amendment to Deposit Account Number 04-1403.

Respectfully submitted,

3/1/05
Date

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